

## Stories in Games for Health: More Pros or Cons? A Roundtable Discussion

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*There has been a debate about whether entertainment videogames should incorporate story or narrative. A concern has been whether story cut scenes break game immersion, and thereby minimize the fun of gameplay. Alternatively, games for health (G4H) have an agenda that goes beyond just having fun. The possible role of story in G4H has not been thoroughly addressed. We have assembled a group of experts who have worked with stories in G4H, and asked some pointed questions.*

**Tom Baranowski:** *From your perspective are there any values or benefits of having a story in games for health (G4H)?*

**Amy Shirong Lu:** Yes. People have an innate tendency to process stories. Their ability to enjoy stories is a cross-culturally universal phenomenon with survival and reproductive advantages.<sup>1,2</sup> Many traditional MUD (multi-user dungeon) games have leaned heavily on narrative elements to help construct the play experience. For example, “Advanced Dungeons & Dragons” (1977–1979) used narratives as an overarching stage of the game world to help the players to create and define different characters and carry out their missions through textual input. These days, stories are commonly seen in the beginning of or interspersed throughout many games.

A good story adds entertainment value to a game, helps to contextualize the health content in a meaningful way,<sup>3–5</sup> brings the players into the game world,<sup>6,7</sup> engenders positive and powerful attention<sup>8,9</sup> and character identification,<sup>10–12</sup> and maintains the interests of players, who act as characters<sup>13</sup> or actors,<sup>14</sup> to feel obliged to improve or maintain health.

“Escape from Diab” (2009), a health game aiming to improve children’s diet and physical activity to combat the obesity epidemic, created appealing characters and plot by integrating children players’ input and managed to maintain children’s interest with successful story cliff-hangers after each of its nine game sessions as indicated by a retention rate exceeding 90%. It is hard to imagine those children would willingly attend a 9-week health seminar that lectured the same health education content.

**Richard Buday:** We’ve found the value of story in G4H greater in behavioral interventions than in learning games. Empirical information seems to be treated cognitively as short-term memory. Story in a didactic game has little impact. But long-term memory is the domain of emotional experiences, and manipulating our emotional processing center is the stock and trade of storytellers.

There is a long history of stories changing beliefs, attitudes, and behaviors. Abraham Lincoln thought Harriet Beecher Stowe’s *Uncle Tom’s Cabin* sparked the abolitionist movement that underpinned the Civil War. Upton Sinclair’s *The Jungle* is credited with an upheaval that changed the American meatpacking industry at the beginning of the 20th century. Theoretically, a device as powerful as storytelling should be part of any behavioral intervention. I say “theoretically” because successful storytelling in videogames has proven problematic. Vast amounts of money have been spent over many years on storytelling in games, primarily through conventional narrative devices like dialog and movie clips (aka, “cutscenes”). As yet, no videogame with the impact of *Uncle Tom’s Cabin* or *The Jungle* has emerged.

For a learning or skill development game, story may be unnecessary; simple drill and practice could be enough. Many entertainment games succeed with only implied stories or with no story at all. “Space Invaders” is about defending against alien invaders without explanation of who they are or why they are attacking. The game has no story beginning, middle, or end, yet “Space Invaders” was wildly popular in its day. Blockbuster puzzle videogames like “Bejeweled” and

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“Tetris” are so abstract, they have no possibility of story context.

**Elizabeth J. Lyons:** I strongly believe that there are numerous benefits to having a story in a G4H. Though there are few empirical studies of stories in G4H, studies from several other literatures suggest that they may be helpful for several reasons. First, story can trigger intrinsic motivation to continue playing the game by being enjoyable. Intrinsic motivation, or the motivation to engage in a behavior in the absence of external pressures or rewards (doing it for its own sake), is strongly predictive of future behavior.<sup>15–17</sup>

Second, story can increase character identification.<sup>18</sup> Character identification may lead to incorporating healthy attitudes and values of the character into the player’s own value system. Similar processes have been discussed using various terms, including integrated and identified regulation,<sup>19,20</sup> experience taking,<sup>21</sup> and in the exercise domain “exercise role identity.”<sup>22,23</sup> Identification with game characters may be a method of encouraging adoption of healthy values and identity because players tend to “try on” personality traits and values of the characters they play.<sup>24–27</sup> “Possible selves” interventions, in which participants imagine how they would like to be, have been successful in changing health behavior,<sup>28</sup> and games may serve as an avenue for exploring a healthy possible self. Role-playing as a healthy possible self could also improve self-efficacy. A comparison of playing versus observing a videogame related to diet found that the interactive game produced greater self-efficacy for healthy eating and that identification with the player character mediated this effect.<sup>29</sup>

For example, in the smartphone game “Zombies, Run!,” the player character saves the world (we hope!) by running. The other characters and many plot points continuously reinforce how important the player’s performance as a runner is to the fate of his or her town and of humanity. The player character and nonplayer characters all highly value fitness and identify the player explicitly as “Runner 5,” further emphasizing his or her identity as someone who runs. Perspective can affect the extent to which a story can change attitudes,<sup>30</sup> and this second-person perspective in which the player is always directly addressed as “Runner 5” may be particularly powerful. I think this is a fascinating area for future research with real potential for subtly (and non-coercively) reinforcing healthy behavior.

Finally, stories are uniquely persuasive, more so than simple presentation of facts. In health promotion studies, narrative persuasion has led to increased knowledge,<sup>31</sup> attention and positive emotions,<sup>32</sup> reduced resistance to persuasion,<sup>33,34</sup> and greater change in attitudes<sup>35</sup> as compared to standard information. It appears that feelings about characters (both identification with them and parasocial interaction with them) are particularly powerful,<sup>33,35–37</sup> indicating that stories with richer characterization may produce greater effects.

**Jesse Schell:** Story can benefit many games by giving players something to relate to, and something to wonder about. If emotional involvement is important to you, having story really helps. In creating the game “Tunnel Tail,” which was designed to help kids understand better how to say no to peer pressure about drugs, we couldn’t see how to do this without

story. The story helps at two levels—on one level, we see conversations involving seduction and refusal playing out between story characters, and on another level, we see different patterns of addiction and the damage they inflict. Similarly, in “PlayForward: Elm City Stories,” we used lurid, but realistic, stories to intrigue players, so that they would care about outcomes in the game.

**Carmen Russoniello:** Whether a story has value in a G4H depends on the purpose of the game. During my dissertation I studied biochemical change during board games and card games and found that the positive chemical and psychological benefits derived from activities was, to a certain extent, dependent on the person’s perception of the activity or game (i.e., do I have the skill to be successful? Is it fun?).<sup>38</sup>

On the other hand, if you are trying to educate a person about a condition or behavior or how to improve the condition or behaviors, then I think a game with a story line with educational components built in is important. In these games the player can create an awareness of their issues and solutions to their problems as well as practice skills in an environment designed for practicing these skills.

**Tom Baranowski:** *What are the problems from having a story in G4H?*

**Amy Shirong Lu:** The discussion about the values and problems of the symbiotic relationship between narratives and gameplay began more than a decade ago.<sup>39,40</sup> Both sides of the debate seem to lack sufficient scientific justification as well as empirical evidence due to the underdeveloped state of the relevant psychological and behavioral research. Therefore, the answer to this question could also be based on sporadic case studies.

In general, a videogame is to be played. So, gameplay is the crux. The storytelling elements should not interfere with the gameplay, leaving the player with little to do. This would be a violation of fundamental game design rules. Even if the conclusion of the story has been predestined to start with, the player must be given the power to feel it was he or she who made the choice. This could put many health game developers into a dilemma given budget and resource constraints. If a story is needed, no matter whether it would be linear or nonlinear, it needs to not interfere with gameplay.

Not all games need narratives. Simple, quick games such as “Tetris” (1984) do not need a story. Other games such as “Angry Birds” (2009) require a simple visual background story and little else: The pigs stole the birds’ eggs, and it’s time for the birds to fight back. Imposing complicated stories on these games would be redundant and not productive for the gameplay experience. (“Angry Birds Toons,” though, is a spinoff project of the original game series.)

Another potential problem would be multiple interpretations of an open narrative. While multiple interpretations could add to the layers of the depth of the meaning, in a health context this could be confusing, and even counterproductive to the health goal, when the message delivered through the story is too ambiguous for the audience to grasp.

A story’s unique immersive capacity is called transportation, or “a distinct mental process, an integrative melding of attention, imagery, and feeling.”<sup>41</sup> Although a completely transporting gaming experience would be thoroughly

entertaining for players, when the players of a health game became immersed in story, they might have the impression that they already performed the health behavior promoted in the game. To ensure the players perform the health behavior, one might integrate the story seamlessly into gameplay. The narrative experience itself could become the desired health behavior. In this context, active videogames with good stories would be an excellent option.

**Richard Buday:** Many videogame players react negatively to cutscenes and long dialog trees that interrupt gameplay. Simply Google “I hate cutscenes” for hundreds of thousands of rants. Videogame players want to *do*, not *watch*. This negative sentiment comes, I believe, not from the cutscenes themselves. If the cutscenes were edited together and presented as a separate movie experience before gameplay, they might be readily accepted. The problem is forcing players to quickly switch from being active and in control of a game to being passive and locked out. The schism is psychologically discomforting.

But, even if bouncing back and forth from active to passive roles was comfortable, it’s questionable if videogames will ever be a great story medium. Film critic Roger Ebert believed games were inherently poor storytelling devices compared to prose and film. “There is a structural reason for that,” he wrote in a contentious blog argument with proponents of videogames as literature. “Video games by their nature require player choices,” he said, “which is the opposite of the strategy of serious film and literature, which requires authorial control.”

I agree with Ebert. In literature, writers lead us down a path and connect the dots. In videogames, we take our own path. We may leave a trail of breadcrumbs, but seldom do we analyze what it means. The difference between how we process the two experiences is profound. Players are psychologically “present” in videogames, much as they are physically present in real life. The best games provide players the appearance of free will and interactive events that occur seemingly at random. No two experiences of the same videogame should be identical. Also like the physical world, videogames typically don’t make it easy to ponder and contemplate intense action before moving on. Players are encouraged to respond as they would to events in real life, quickly and instinctively. Hesitation can mean death.

Readers and movie audiences are also immersed, but not in the same way as in videogames. This dissimilarity allows readers or movie audiences time to deliberate on what’s happening. They can close their book in the middle of an intense or confusing scene and consider story events slowly. They can rewind a movie viewed at home a few seconds and give it a good think, or watch it entirely again in a theater to tease out more meaning, never fearing that story events won’t unfold the same way. Linear storytelling is intrinsically different from nonlinear storytelling (if such an animal even exists), and much stronger. We haven’t yet invented powerful nonlinear storytelling tools or conventions.

**Elizabeth J. Lyons:** I don’t believe that problems arise from the existence of story *per se*. Many of the arguments against story in games are truly arguments against cutscenes and/or poor storytelling, not against story itself. Though many enjoy cutscenes when they are used judiciously, these scenes turn off some players and could reduce the impact of G4H by

decreasing engagement and enjoyment. Players seem to particularly dislike storytelling that removes their agency and takes them out of the game. This reaction makes sense, as games are more enjoyable when they allow for greater feelings of autonomy and competence.<sup>42</sup> Of course, to tell a scripted story, game developers must restrict player autonomy (and all games have rules that restrict autonomy to one degree or another). But there are methods of supporting autonomy and competence even in a highly scripted and linear game. The more that story can be told in-game, using game mechanics or environmental cues or the like, the better. Careful attention must be paid to whether the story and health goals of the game make sense when paired with the chosen mechanics.

The traditional videogame “Catherine” is in my opinion an example of very well-matched story and game mechanics. It is a game about a man who feels suffocated and overwhelmed by adulthood and his relationship. The primary game mechanic is based on crate puzzles, where the player moves crates next to one another to create paths over obstacles. The main character must climb a seemingly endless tower of crates to escape an ever-encroaching void of nothingness beneath him. Though basing an entire lengthy role-playing game on crate puzzle mechanics seems like a terrible idea, I found this mechanic very satisfying, especially when the main character was pursued up the tower by embodiments of his fears (a baby, his girlfriend in a wedding dress, an exciting but frightening “other woman,” etc.). Sometimes literal fights and confrontations may not be the best gameplay choice. Creative matching of game actions to game and character themes may be able to produce something really meaningful.

I’d put forth games like “Catherine” as well as “The Last of Us,” “Shadow of the Colossus,” and games in the “Zero Escape” series (“9 Hours, 9 Persons, 9 Doors” and “Virtue’s Last Reward”) as examples of storytelling made better by being in game form. I disagree with Richard and with Roger Ebert because I don’t think that authorial control and player autonomy are mutually exclusive. Games by their very nature must have rules and constraints; a good narrative is simply a type of constraint that doesn’t have to hinder exploration or choice more so than other rules. I will admit that it often does, and that is unfortunate. But linear storytelling can still provide for experiences of choice and autonomy within the constraints of the larger narrative. There was an interesting article on Kotaku recently in which people wrote up descriptions and posted pictures of “their” Commander Shepard from the “Mass Effect” games.<sup>43</sup> Despite a very linear story, each Shepard was different, and people clearly had strong feelings about the choices they had made to shape their characters. Ultimately, every player got one of the same three endings, but the experience of the game could feel quite different depending on how it was played. Perhaps we put up with the additional constraints of linear narratives because the payoff of identifying with a set of characters can be so satisfying.

**Carmen Russoniello:** My experience as a recreational therapist taught me the more you structure an activity for therapy, or any other purposes for that matter, the more you take the fun out of the game. This is probably why in a series of studies we found casual videogames (CVGs) to be so effective

in reducing depression and anxiety while increasing mood and cognitive performance.<sup>44,45</sup> These games have few rules, almost anyone can master them quickly, and they don't have a story line *per se*. My hunch is that if you compared casual games with story games to reduce depression (i.e., those designed to change behaviors with a storyline), the casual game would be more effective. I say this because a CVG takes you away from the problem, gives positive strokes, is totally controllable by the player with very little stress. This "let go" effect seen in these games is in my mind what creates the benefit. Storylines tend to keep you focused on the problem.

**Tom Baranowski:** *If you are going to include a story, what are its important characteristics?*

**Amy Shirong Lu:** For health game development, thorough preliminary study of the game players, or the targeted population, would be essential. Just like one game would not be played by everyone, health games have a more focused nature because of their health purpose. Therefore, to know the audience well would significantly help the designers to craft a game. The insight from the audience would help to design attractive characters and engaging plots.

Once the design team has gathered enough "raw" materials from the audience, they should start integrating the audience input into the design process. If a story is what the audience wants, its inclusion should not violate the fundamental design principles of videogames (i.e., the story should not overshadow the gameplay).

A lot of the times, health education information does not automatically get along with the story crafting process. This would result in some of the stories considered to be "dry" or "uninteresting" by the players, especially for those created by academic researchers. To be successful, the story should not be too didactic or making the health goal of the game too obvious. It should incorporate the health element seamlessly in its story arc instead of telling the players to do something didactically.

**Richard Buday:** Great writers can break the rules, but novice storytellers should adhere to time-proven techniques. Humans learned long ago the importance of telling and receiving stories. Like walking upright, story was critical to survival. Over millennia, writers created ways proven to immerse individuals within virtual worlds. They learned how to fill these lands with vivid emotional experiences and rich learning moments. In short, good storytellers discovered how to cognitively transport an audience to a story world, get them affectively invested in the situations occurring there, and keep them inside for significant periods of time. Audiences came to understand and accept the language of storytelling, willingly suspending their disbelief and leaving the writer's virtual world changed by their experiences there.

**Elizabeth J. Lyons:** From the perspective of what we know about persuasion and behavior change, I would predict that a rich cast of interesting characters and opportunities to identify with them would be very important. From the perspective of what we know about game enjoyment and motivation, I would predict that suspense<sup>46</sup> and promotion of feelings of autonomy, competence, and relatedness<sup>42</sup> would be very important. Story likely has more impact on relatedness, but

changes to the game related to story can positively or negatively impact feelings of autonomy and competence. All aspects of the game (story, gameplay mechanics, and health-related goals) must balance and reinforce one another to create a really compelling G4H.

A fascinating study was published recently about character identification in books that illustrates the power of even supporting characters.<sup>36</sup> People who read "Twilight" and "Harry Potter" books implicitly associated themselves with vampires and wizards afterwards. They not only identified with the main character, they also felt like part of that character's social group. This finding opens the door for not only virtual self-modeling via identification with the main character, but also modeling, social influence, and peer support from characters to whom players feel close.

**Jesse Schell:** There is no simple answer—only this complex answer: The story must resonate with the core purpose of your game.

**Carmen Russoniello:** This is an impossible question to answer because it depends on the purpose of the game. Plus, once the purpose is established I would ask the consumer and professional how best to meet the goals. I would also test the concepts in the lab using physiological measurement. At this point I would be in a better position to answer this.

**Tom Baranowski:** *How should a game developer go about developing the story and incorporating it into the game? Is it the centerpiece around which the game is developed, or is it the dressing that gets wrapped around key game mechanics?*

**Amy Shirong Lu:** I don't think there is any simple, universal formula that would apply to story development for all kinds of games. Like what I mentioned before, there should be sufficient audience research done to decide if a story would be necessary to achieve the health goal of the game. If the answer is yes, the next question would be: How would that get along with the gameplay experience based on the audience characteristics?

For example, in the gaming community, there are a group of "advanced" players who would pay the most attention to the gameplay. They tend to ignore the tutorial as well as the narrative by skipping those sections to get to the play session directly. If they found a game highly interesting or playable, they would likely give it a second round of play and pay more attention to the sections skipped previously.

Therefore, if the design team has found most of the targeted population to be experienced play experts, the story could be included into the game but should be skippable when the players want. Another way to get around that would be to include some of the essential play information into the tutorial and narrative sections. In this way players would have to go through those sections to continue play, at least for the first round of play. This step would put higher demands on the design team. But if done well, this would help to get the message through. As for beginner players or nongamers, they tend to follow all sections one step after another. So the design team would be better off creating a gameplay experience involving the story to start with.

No matter how advanced players are, a game meant to be played multiple times should allow players to skip the

narrative elements, such as cutscenes. The players could get bored if they have to sit through the same narrative time and again unless each repetition of the game brings a different experience. For example, “Journey” (2012) offers players different travel companions as well as different route options for each repeated play session.

**Richard Buday:** We find games with minimal player activity can tolerate significant story exposition. For example, choose-your-own-adventure novels (also called “game books”), text-based adventures, interactive fiction, and visual novels do not require players switch back and forth between fully active and completely passive roles. Clicking a link while reading or watching a cut scene is as minimally invasive as turning a page while reading a novel. With minimal game mechanics, storytelling can be deep. For these games, professional writers should be employed to work their magic.

Games with intense action and complicated mechanics would do well to keep narrative exposition at a minimum. No writer is needed if no story is told. However, if story is critical (as it would be in a behavioral intervention), I believe the story should be told separately (and again, professionally), preferably before gameplay begins. Traditional media are stronger storytellers than games. Have players experience the game premise as a short story, novella, novel, comic book, graphic novel, or a short film or feature length movie a week before gameplay. That way, players will already know and be fully invested in the game’s context, setting, and characters. In lieu of storytelling during gameplay, game developers can concentrate on having players explore story scenes and situations that players already know and love.

Story used as mere decoration in a game trivializes both the story and the game. Games that are stronger when based on a story, such as behavioral interventions, should have mechanics integral to the storyline. Nonetheless, history has no requirement that successful games include stories either as window dressing or as foundation. Chess is a battle between two kingdoms, but nothing about the realms is known, not even if one side or the other is protagonist or antagonist. Card games played with a deck of 52 kings, queens, jacks, and numbers of various suits imply a story about royalty, but little more. Checkers is as abstract and story free as “Tetris.”

**Elizabeth J. Lyons:** All things considered, I believe that story and gameplay mechanics should be developed simultaneously and iteratively to ensure that they support one another. Additionally, interactive storytelling has an advantage over traditional methods insofar as it can incorporate different mechanics to reflect and enhance different moods, settings, or events. Regardless of whether the gameplay or story idea comes first, they should be developed in conjunction with one another.

Another important point is the mantra of show, don’t tell. Games are an amazing medium for storytelling because traditional exposition can be replaced with something interactive. People can experience the story instead of being told about it. They could find letters, overhear characters talking about an event, play through a flashback, or see environmental signs that indicate what happened. The opening of “The Last of Us” is one of the most affecting experiences I’ve ever had with a piece of media, and I believe that my strong reaction was due to the novel forms of storytelling that were employed. After a very brief cutscene, the player is allowed

to experience the backstory of the game via exploration gameplay. Exploration provides plenty of information about what is going on without true exposition: You see a newspaper article and TV news report in rooms you explore, and explosions and ambulances are visible through windows as you pass them. Rather than showing your attempt to flee the city as a cutscene, which is what would typically happen in a similar game, you do the running yourself. Though this sequence was extremely linear, it allowed for actual role-playing instead of passive attention.

**Jesse Schell:** It all depends on the game. Story can serve many purposes. Sometimes, it is the backbone of a game experience. Other times, it is simple window dressing. Other times again, it is a way to make players understand the gameplay rules better. Story must be considered case by case.

**Carmen Russoniello:** Game designers should use focus groups as much as they rely on content experts. You can ask someone if they like a game, and they will tell you. Beneath the surface answer they are also saying “this affects me positively” and “this does not.” We are exploring the theory through physiological measurement, eye tracking, and biochemical analysis correlated with psychological reports that these focus groups also “ask questions” of the autonomic nervous system (ANS), which is concerned with our survival, first and foremost. While people cannot articulate why they might like a certain color, their ANS can inform them whether the color threatens or not. This character scares me, this one does not, etc. We can actually capture these moments with physiological measurements such as heart rate variability, a robust measure of ANS function.<sup>47,48</sup> Hence, the consumer should be central to game development.

**Tom Baranowski:** *In your opinion, considering everything, are G4H better or more likely to change behavior (or a health outcome) with a story or without?*

**Amy Shirong Lu:** The answer would depend on the goal of the game and the players (targeted population) and specific health behaviors (outcome). Narratives, compared with non-narratives, have many persuasive advantages in terms of attitude and behavior change. For example, it [narrative] helps to build up an emotional connection between the players and the characters, overcome resistance to the persuasive attempt, motivate the players to better engage with the play sessions. All of these could be valuable. To effectively achieve those goals via health games, though, would be a different story.

On the other hand, narratives should not be treated as a panacea that would help to solve every health game problem. For videogames, the gameplay experience is fundamental. Narratives should only be included to facilitate such experience when they are needed to achieve the health goal based on the target population’s characteristics.

We still know very little. For example, many rules and principles in creating linear, noninteractive narratives (e.g., novels, movies) are not necessarily applicable to game design. Few academic publications have empirically explored this issue via the scientific method. A few publications from the game industry have covered this issue and derived rules of thumb based on practical experience and case-by-case observation. Perhaps a closer collaboration between the two

would help to start a meaningful conversation that would systematically answer questions such as whether-when-and-why a story would be needed for G4H.

**Richard Buday:** If a target audience is already committed to the desired behavior, then a story-free knowledge game or drill and practice G4H to build competence and confidence is probably sufficient. However, if players are unaware, unconvinced, or resistant to the desired behavior, storytelling is critical. Story immersion can suppress counter arguing and internal resistance to behavior change messages and increase audience investment in those messages. A great story well told might be the most effective means of behavior change ever invented.

**Elizabeth J. Lyons:** There is clear evidence that stories are effective tools for promoting behavior change and may be particularly powerful when told interactively. Ultimately, though, effectiveness likely depends on the individual. I can't help but answer these questions using the games that I play and enjoy as context. I wonder if a key issue truly is the issue of "role-playing." Do I not mind the constraints of story because I enjoy acting out the life of a character? Since it's not really me, but rather me as the character, is it okay that my actions are constrained? Even though "my" Commander Shepard was a violent, short-tempered woman who skirted the rules, she was still a fundamentally heroic person who was going to follow certain larger patterns of behavior no matter what. The fun of some games is in the unexpected and the ability to feel incredible autonomy, but those are very different experiences that I go into with different expectations. I suspect that people who do not enjoy role-playing games as much as I do would feel differently about their preferred balance between story and autonomy. It might be that explicitly calling a game a role-playing game at the beginning could change player expectations and acceptance. Regardless, even for those who are not inclined towards playing story-oriented games, I think a story that is cleverly told without reducing feelings of competence and autonomy could improve both the fun of the game and its behavior change efficacy.

**Jesse Schell:** As with so many things involving human transformation: "It depends."

**Carmen Russoniello:** Behaviors are driven by physiology just as behaviors drive physiology. Games definitely change physiology. The question to me is whether a game can change physiology in a direction that improves physical and emotional control consistent with improved health and performance. In my opinion, if a game is developed without the input of those who will play the game, then it is flawed because it often misses the emotional component and its impact on gameplay. There are a number of examples of "Brain Games" developed by scientists and clinicians that worked in a lab but were a bust on the market. This is primarily because people do not comply to a prescriptive regimen of anything unless it is fun. Here is an example of what I mean. As recreational therapist in an acute psychiatry facility we were charged with stress management. We are an experiential-based profession believing in the therapeutic value of the activity and put less emphasis on the therapist skills. One

group we ran was cognitive-behavioral based and designed to teach depressed patients about their recreational habits, importance to their health, and mechanisms to change them. This was a standard group throughout the profession. Eventually, someone did a pre-post study of these groups and found people were more depressed after the group than before! The authors speculated the results were because the group reinforced their deficits. Hence, directed storylines can be effective in certain circumstances, but they can also have a counterproductive effect.

**Tom Baranowski:** *Well! That was quite a divergence of opinions. Whether stories should be used in G4H may depend on characteristics of the game's objectives (e.g., cognitive learning versus performing an aversive behavior), the individual player (e.g., gameplay skill, player knowledge of the behavior, receptiveness to goal playing), the game designer (e.g., whether formative research was used), and the use of story in the game (e.g., as modeling of behavior, as cliff-hanger to motivate return). Whether, how (the conditions under which), and the possible mechanisms of change (including physiological) by which stories may help or hinder a game's ability to influence behavior change are not known. Hopefully this Roundtable Discussion will stimulate further intensive research of the issues, and the results will appear in a future issue of G4H Journal.*

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## Brief Biosketches



**Amy Shirong Lu, PhD**, is an Assistant Professor in the Department of Communication Studies of the School of Communication and a member of the Robert H. Lurie Comprehensive Cancer Center at Northwestern University. She studies the persuasive mechanisms and psychological, physiological, and behavioral

effects of media technology such as health videogames and has written widely on interactive media and their effects on children's dietary intake and physical activity behaviors. Dr. Lu received her PhD in mass communication and MA in communication studies from the University of North Carolina, Chapel Hill.



**Richard Buday, FAIA**, is president and founder of Archimage, a 30 year-old digital arts studio. Richard is also president of Playnormous LLC, Archimage's health education videogame company. A professional architect by training, Richard and his firm have won more than 50 international

awards for design, including broadcast television commercials, illustration and graphic design for corporate identity, magazine covers, and print advertisements, Web sites, and videogames and interactive media. Richard taught at the University of Houston for more than 15 years and has written extensively on the use of computers in design. Richard has also been invited to lecture or deliver keynote addresses at more than 70 international conferences and symposia. More than 50 articles about Richard and his firm have been published—from *U.S. News and World Report* to *The Financial Times*. Archimage is an approved Nintendo GameCube developer. The firm's clients include Nintendo, Time Warner Communications, Compaq Computer Corporation, IBM, Knowledge Adventure, The Walt Disney Company, the Texas State Education Agency, Ziff-Davis Communications, Baylor College of Medicine, and the National Institutes of Health.



**Elizabeth J. Lyons, PhD, MPH**, is an Assistant Professor in the Institute for Translational Sciences at the University of Texas Medical Branch. Her research concerns the use of technology to increase motivation for behaviors related to energy balance (that is, physical activity, sedentary behavior, and food intake). She is particularly interested in the power of narrative and character identification to

increase motivation and self-efficacy. Although most of her research is on commercially available videogames, she is also

studying other media that include characteristics of videogames, such as activity monitors and their competitive mobile applications.



**Jesse Schell, MS-IN**, is the CEO of Schell Games, the largest videogame studio in Pennsylvania. He also serves as Distinguished Professor of the Practice of Entertainment Technology at Carnegie Mellon University. Jesse has worked on a wide variety of innovative game and simulation projects for both entertainment and education, but he is best known for his award-winning

book *The Art of Game Design: A Book of Lenses* and for Beyond Facebook, a talk at the 2010 DICE Summit where he described a future where games and life become indistinguishable. He is a former chair of the International Game Developers Association, and in 2004 he was named one of the world's Top 100 Young Innovators by *MIT Technology Review*. Before starting his own company, Jesse was the Creative Director of the Walt Disney Imagineering Virtual Reality Studio, which he helped to develop interactive theme park attractions as well as "Toontown Online," the first massively multiplayer game for children. Before that, he worked as writer, director, performer, juggler, comedian, and circus artist for both Frehofer's Mime Circus and the Juggler's Guild.



**Carmen Russoniello, PhD, LPC, LRT, BCB, BCN**, has more than 20 years of clinical experience as a therapist/counselor as well as a researcher. He is currently Professor and Director of the Psychophysiology Lab and Biofeedback Clinic at East Carolina University. He serves as scientific advisor to Biocom Technologies, where

he helped develop several new heart rate variability biofeedback programs. He is a Fellow in both general biofeedback and neurofeedback. Dr. Russoniello is a Past President of the Association for Applied Psychophysiology and Biofeedback and the American Therapeutic Recreation Association. He teaches biofeedback and stress management courses at East Carolina University and directs a biofeedback-training program for Marines with posttraumatic stress disorder and traumatic brain injury. Dr. Russoniello is currently conducting research for the Department of Defense on the efficacy of biofeedback training and telemedicine applications. Dr. Russoniello's groundbreaking psychophysiological research on videogames, mood, and stress includes exploring the intrinsic physiological and psychological qualities of causal videogames and their potential therapeutic value. In addition to peer-reviewed journal articles, Dr. Russoniello's research has been featured in the *New York Times*, *Washington Post*, *Newsweek*, *Wired Magazine*, CNN, BBC, *Ladies Home Journal*, *Women's World*, and Web M.D.